

COMPUTERWORLD

The Newsweekly for the Computer Community

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Cambridge, Massachusetts, March 20, 1968

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Reaction To Competition

IBM Offers Slower Mod 20; 30% Price Cut: 4 Up To 16K

WHITE PLAINS, N.Y. - IBM reacted to the recent series of low cost computer systems announced by competition and has come out with a 30% cheaper version of the 360 Model 20.

This puts it in direct price competition with the NCR Century 100, the Honeywell 110, and other 1968 versions of third generation hardware.

The new IBM system appears to be a slowed down version of the present 360/20, with which it maintains complete hardware compatibility. Card and disk versions are available, but no tape version. The multifunction card machine and the printer have been slowed to approximately 70% of their previous capabilities, as have the instruction timings.

Only the smaller capacity Model 12 disk drive can be used on the new systems. This drive has a capacity of 2.7 million characters which are arranged on one hundred tracks, as opposed to the 5.4 million capacity of the Model 11. One advantage of the smaller capacity unit is that the smaller number of tracks makes for less movement in getting the heads to the tracks, so that the average access time is only 60 msec, as opposed to the standard 75 msec. on all other models of the 2311.

Lowest Prices

Prices for both card and disk systems of the new Model 20 are the lowest in the System/360 line. Monthly rentals begin at \$1359, with a purchase price of \$60,410. Monthly rental for a typical card configuration is \$1459, with a purchase price of \$64,710. A typical disk system rents for \$2556, with a purchase price of \$126,390.

Programming Compatible

Most existing Model 20 programming support will operate with the new version of the system, including RPG (Report Program Generator) and punched card utility programs for collating, merge-sorting, gang punching, reproducing, listing, and summary punching.

New Unit Designs

The units designed especially for the new system are a new model of the IBM 2560 multifunction card machine, and a new model of the 2203 printer.

The 2560 combines into one operation most of the functions of a card reader, collator, gang punch, reproducer, and sorter. It reads up to 310 punched cards a minute and punches

120 characters per second, according to IBM.

The 2203 printer can operate at speeds up to 600 lines per minute.

Magnetic Disk Storage

Magnetic disk storage is also available with the new unit. Users can attach up to two 2311 disk storage drives, capable of storing a total of 5.4 million characters of information. This data is randomly accessible in an average of 60 milliseconds. Operators can use an optional printer-keyboard to query the computer. It can also be used as an output printer.

Delivery Schedule

Customer deliveries are scheduled to begin in the fourth quarter of this year. The system will be manufactured at IBM's facility in Boca Raton, Fla. It was developed at IBM laboratories in San Jose, Calif., Rochester, Minn., Endicott, N.Y., and Boeblingen, Germany.

For an editorial comment on the new 360/20 see page 2.

Fast Disk Drives Marketed By MAI

NEW YORK - Disk based 360 users may soon be able to improve their throughput without reprogramming as a result of a marketing agreement between Memorex and MAI.

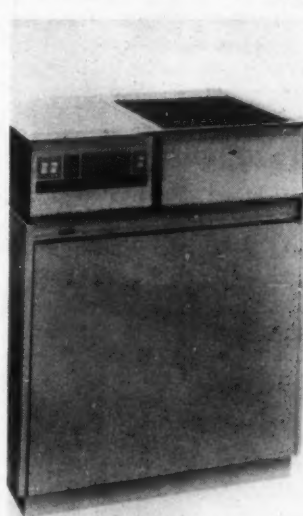
The agreement calls for MAI to market and service the Memorex 630 disk drives, which are considerably faster than the IBM 2311s they replace. (CW Nov. 29, 1967, p. 4). Prices to users have not been decided.

Deliveries Soon

Orders are not yet being solicited but will be accepted on an individual basis, according to MAI's William K. Klemens, who is in charge of field operations. "We just have not been able to supply the information to the field that we want them to have," he said.

Whit Watson, MAI's vice president in charge of product development, was also unable to commit himself on when deliveries would take place. "Our men are now working with the Memorex people to coordinate matters, so I don't think it will be too long now."

According to Robert A. Fox, this is the first marketing agreement for



The MAI disk drive, compatible with IBM 360 computers, and plug to plug interchangeable with IBM 2311 disk drives - available in two months.

the new unit, which was announced last November. Fox is manager of

Memorex's Peripheral Systems Division, which makes the 630.

The average access time of the Memorex 630 is only 50 msec, 33% faster than the 75 msec average time of the IBM 2311 Model 1 which it can replace.

Another advantage he cited was that the system uses an electric motor instead of the hydraulic motor traditionally used by IBM. Joseph Koenig, Peripheral Systems' chief engineer, commented: "Now we only need to have trained electrical engineers; we don't need to back them up with hydraulics experts."

MAI Runs Own Schools

MAI has the largest maintenance force of any independent. It trains its own people using a company school just outside Philadelphia.

After a short break last year, courses are now proceeding regularly. This school trains people for servicing the IBM computers which MAI has on lease throughout the country. They are also being used to train servicemen to support a plug for plug IBM 360 compatible tape unit which MAI announced last fall. Delivery of that unit is scheduled to begin this month.

Canning To Face Galler In Vote

NEW YORK - Richard Canning, a west coast consultant and writer on data processing was nominated to oppose Dr Bernard Galler of the University of Michigan in May's election for the ACM presidency.

Galler is ACM's current vice president, traditionally thought to be a stepping stone to the presidency. However, rule changes that come into force this year may affect the situation. These changes mean that for the first time all candidates have to write a statement of their opinions for publications in the ACM Communications.

Galler told COMPUTERWORLD he thought

that this change was good even though the various candidates' statements would be written quite independent of their opponent's and prevent any extensive interaction before the election itself.

Much Common Ground

The presidential candidates both agreed that there was no real chance of any decrease in society dues, and that the society had to play a larger role in the years to come without becoming a lobbying organization.

Indeed, the differences between them appear to

be more a matter of priority than anything else.

Galler said that one of the main things he expected to accomplish would be improved membership communications through the use of "Selective Dissemination" techniques. He felt that present studies showed that SDI was an appropriate way to go - although the exact format is not yet clear. He hopes to provide membership access to many additional items such as informal reports and manuals.

Asked about the role of the ACM in society at large, and its relationship to other bodies such as the DPMA, he said that he envisaged the ACM to become known to those outside as a source of expert information on computers and computer technology. He would like, he said, to see the DPMA as a member of the American Federation of Information Processing Societies, but held out no real hope for much change here. "We have been talking for a long time," was his comment, "and nothing seems to come of it."

Canning "Would Be Active"

Richard Canning, who is a member of DPMA as well as ACM, pointed out that in the San Diego area a number of joint ventures have been held, and that this was all to the good. He said that he expected to be an active president, if elected, and would be traveling a good deal. "That's one of the prices of the job," he said.

He hopes to follow the lead taken by the present president, A.E. Oettinger, although he might not be quite so strong minded about some questions. "I was in favor of the suggested move to Washington," he said, "but perhaps not as strongly as Tony. Now it seems clear that the way to do

(continued on page 7)

Share/Guide Merger

No Alternative Plan Produced

By Patricia Nesbit

HOUSTON - Share's executive board has been unable to produce the promised alternative plan in case the Share/Guide merger falls through. This was reported to the General Session of Share XXX by Phil Cramer, president of Share.

Cramer also reported that there is no new target date for considering alternatives to merger.

Roy S. Dickson, Philipps Petroleum Co., and Carl F. Roessler, Yale University, presented pros and cons of the merger.

Hippocampelephantocamelos?

Roessler, calling himself a "former IBM salesman gone straight," spoke against the merger. He first noted that the merged group lacked a name, and he proposed "Hippocampelephantocamelos" (borrowed from "Cyran

de Bergerac"). But his humor soon disappeared as he launched into a list of risks inherent in the proposal.

He declared that the proposal was replete with rash assumptions; that Share's executive board had made an emotional commitment; that the early commitment was slanted to give the impression of more membership support than actually existed; and that the organizations have legitimate differences, styles, and needs.

Unweildy Size

Roessler argued against "Hippo's" unweildy size. He stated that geographic limitations would be imposed because few cities could handle meetings of such a large number of people. He also claimed that working sessions would be neglected and that working talent would be diverted, with no

leadership, technical interface, or control.

Differences in styles and needs of the two groups are a primary factor in Roessler's opposition to the merger. He said that Guide was geared to a higher level of management requests and considered speed a primary factor, giving hardware secondary consideration. Share, he said, was as interested in means as in ends. He noted that the same type management system at Yale, his own installation, was not satisfactory because the scientific (Share type) and business (Guide type) groups did not have compatible needs.

Finally, Roessler declared that the merged group would be less effective in dealing with IBM. He said that Guide fits IBM marketing methods while Share does not, because "Share

(continued on page 3)

NEXT WEEK IN COMPUTERWORLD

Real Test for Your Cobol Computer From Standard.
CC Communication Story.

Editorials

Computers & Soda Pop

It seems to be the fate of computers to have to take legal precedents from the most unrelated events. Computer copyright, a rather technical and important subject insofar as the law is concerned, is based on the case of a pianola roll! In the eyes of the law, the holes on a pianola roll are just about the same as the pulses on magnetic tape.

After the pianola roll, which restricts our rights, comes the soda pop bottle, creating unexpected liabilities. Soda pop bottles can blow up suddenly. When they do, and if they damage something or hurt someone, it has been held that the claimant does not have to explain just where the negligence occurred, but can recover damages simply on the basis of damage suffered. The reason for this is that someone has been negligent if you have a bottle that explodes.

Now, as regards programs, the law is conceivably going to fall the same way. If a program blows up and damages someone — perhaps loses him his job by calling him a drunkard, or destroys his credit, or does something equally damaging — it is possible that the courts will follow the soda pop precedent and hold that it is not necessary to find the negligence involved.

The fact that negligence — in the soda pop case — is totally different from negligence in computer programming may well be entirely overlooked.

Isn't it a little unnerving to feel that our fate, and the fate of our rather revolutionary industry, will probably be decided for years to come as a result of these rather accidental precedents?

Why Not Call Your Salesman

Many users at the bottom end of computer lines — particularly with Honeywell 120s, IBM 360/30s, IBM 360/20s, and NCR 315s — have seen their suppliers introduce still cheaper systems this year.

In many cases (as we mentioned in our series "Saving EDP \$s With Your 360/25") these systems can save user dollars and still do the work adequately. However, it is asking a little too much for a user to expect his equipment salesman to come to him and tell him that he is paying too much!

But there is nothing to stop you from calling the salesman and asking him to prove to you that you are not paying too much, is there?

Why not give him a call?

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The Newsweekly for the Computer Community
TM Reg. U.S. Pat. Off.

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If Proposal Times Are Wrong Who Has To Carry The Can?

By Alan Taylor

This is the third of four installments on the responsibility of user management. We said in the first two installments that a user takes on a big responsibility when he buys computer hardware — often a bigger responsibility than he thought he bargained for. A proposal drafted by a large vendor, we said, may delude a user into thinking that he is guaranteed manufacturer support and software, as well as hardware. In fact, it may commit the user to provide "sound programming," "good supervision," and other nebulous duties — and can be inserted in the letter of transmittal, or in often unread parts of the proposal. We therefore urged users to carefully review all elements of a vendor's proposal.

This week, we tell how manufacturers' lawyers see to it that responsibility for timing also is borne by users. Next week's installment will summarize the first three and tell how users' lawyers have been unable to cope with users' increasing responsibilities.

The handling of timing problems is an awkward one for a manufacturer. Unlike other cases, timings are immediately apparent. Proposals include timings in minute-and-second detail, which are then worked into daily and monthly utilizations, which are then used to get financial figures. These are the figures that appear in all executive reports as to why to choose brand A over brand X. Everyone has his eyes on these figures.

But the manufacturer often has little knowledge of the actual facts when the proposal is being prepared. Particularly where Cobol or Fortran is being used he may not yet have the compiler, and even if he does, the performance figures of object time programs are practically never given.

So the legal advisors of the manufacturing firm try to

see that their client has as little responsibility for the timings as possible.

The Methods Used

Three methods are used to shift the responsibility from the manufacturer to the user. They are:

State that times are estimates only.

Show that it is reasonable that the times are only estimates.

Qualify the conditions of the timing so that the customer cannot pin the results down.

Making sure that the timings are called estimates may seem obvious, but the word need only be sneaked in once. A common way to do this is to use a title page with the word "estimate" somewhere. Then, on the next page, figures can be given without qualification. The salesman will mention this fact as little as possible.

Why Estimates Are Used

The second method usually involves a sentence like: "Stating timing estimates down to minutes and fractions of minutes implies greater accuracy than exists." Any reasonable person will accept that to some extent they must be estimates. But the key is that *there are no percentages associated with them*. To accept this statement means that the user gives up all rights to rely on the estimates. To protect himself, the user must ask the supplier to what extent the timings are inaccurate.

Making the User Responsible

The third technique involves putting on the user some undefined responsibilities and making the achievement of the timings depend on them. Typical responsibilities include good programming, good operating, etc. As was pointed out last week, this can be done unobtrusively.

This means that a user is generally unable to pin a manufacturer or salesman down to a suitable comparison.

Letters to the Editor

Argument Has Gone On 7 Years

The problem undertaken in 1960 was to identify a coded character set that would be acceptable to all elements of the information processing industry. The requirements of keyboard devices, communication systems and data manipulation in computers were some of the primary elements to be satisfied.

The 7-bit standard code is an outstanding success, at least insofar as acceptance by the national and international standards bodies is concerned. But benefits of standardization are not derived from "paper" standards. They must be used. IS ASCII being used?

The ASCII is, indeed, finding widespread application in data transmission systems as well as in computer terminal devices of the display and teletypewriter variety. Examples can be found in the Federal Government, airlines and data processing service systems.

Notably missing from those areas where ASCII is being applied are computers. Why is it not being used in computers?

One possible reason is that users have not had an opportunity to procure computers and associated software for processing data coded in ASCII.

The view is sometimes expressed that computers are so much faster than the read-write rate of input/output devices that code translations "doesn't cost anything".

Translation costs, if not free, are most likely to fall on the user. It seems fairly obvious that during the time a computer is occupied in doing code translation it is not available for other uses. It should also be noted that "code translation" is often not a simple matter of a hardware matrix or unbroken sequence of "table look-ups". Within a single record there may be characters which require transla-

tion intermingled with "packed" data which is not to be translated.

Because of the difficulties of such translation, opinions have been expressed that "packed" data should be disallowed in interchange between two computers which do not use the same internal code.

Despite the fact that the standardization effort has been underway in the ISO and USASI for more than seven years, the question of whether the standard code is applicable to information processing or just to interchange is still being argued.

L.L. Griffin

National Bureau of Standards

Report Breakdowns?

In our town this week the New York

Central Railroad was fined \$700 for delaying a few dozen people for five minutes at a blocked crossing. But when the local bank computers "went on the blink," as the people told me when I inquired why my statement was wrong, no one even reported it in the paper — never mind fined them.

I wonder how many thousands of people's credit references were endangered — for much longer than five minutes. I think that there should be a standard of performance, like there is for running railroads, and that any infraction should be automatically reported and investigated.

What about it — Congressman Brooks?

(Mrs.) E. T.

Framingham, Mass.

Standards: Let Your Voice Be Heard Effectively

Congressman Brooks has asked the computer community to rethink basic standardization problems (See CW Feb. 14, 1968, p. 2), and Dr H. Grosch, director of the National Bureau of Standards' Center for Computer Sciences, has agreed to review all comments and suggestions from COMPUTERWORLD users.

This is YOUR opportunity. Use the coupon below to send us your comments. They will not be ignored!

To The Editor, COMPUTERWORLD, 129 Mt. Auburn St., Cambridge, Mass. 02138

I am enclosing, on a separate sheet, comments for the consideration of Dr. H. Grosch, director, the National Bureau of Standards Center for Computing Sciences.*

These are relevant to:

- ☐ Brooks' letter, Point 1 — "There is a need for specific problem definition in the data processing standardization effort."
☐ Brooks' letter, Point 2 — "The standardization effort must be altered to optimize results."
☐ Brooks' letter, Point 3 — "Independent criteria identifying the characteristics of a new generation common computing language must be developed."
☐ Other.

See COMPUTERWORLD Vol. 2, No. 6, p. 2 or Communications of the ACM Vol. 11, No. 1, p. 55 for the text of Congressman Brooks' letter to Charles L. Schulz, director, Bureau of the Budget.

Name

Title

Company or Organization

Address

I do ☐ do not ☐ wish you to consider these comments for publication in CW.

*Copies of your comments will be forwarded to Congressman Brooks by COMPUTERWORLD.

Bypass Programmers!

Engineers Told To Share Time

NEW YORK - A proponent of time sharing says that one of the great advantages of the service is that programmers can be bypassed. Thus, design engineers monitor their own programs without having to go through computer programming. Time sharing allows an engineer to set up a problem as a program himself and work it through to conclusion, according to George Rabe of Bechtel Corp. He said that time sharing helps the design engineer to reserve key decisions for

himself, rather than allocate them to a huge batch processing computer system.

Rabe was speaking to a group of consulting engineers at a seminar sponsored by General Electric's Manhattan computer center. He said that by using small programs an engineer can design a structure "column by column," with optimum continuity of participation in the computer by the engineer. This is because of the fact that each column can be analyzed before the next column is designed.

Athana Will Mail Disk Packs To Customers Who Phone Them

WINSTON SALEM, N.C. - The U.S. Mail will be used to deliver Athana disk packs, the public relations manager for Athana Corp. told COMPUTERWORLD.

It appears that the newly formed corporation bases its claim to the fastest disk pack delivery available, on the fact that postal facilities will be used, and postal rates charged. Other firms recently announced disk pack deliveries of 24 hours.

Athana plans to set up manufacturing, distribution, and service facilities across the nation, according to its president, George L. Athanas, who was formerly president of MAC Panel. Public relations for the new

The disk packs are compatible with the IBM 1316 disk packs, and can be used on all the various disk drives that use these packs, including those manufactured by IBM, Control Data, Honeywell, and Memorex.

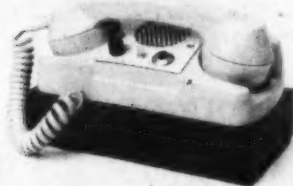
Voice 'Piggy-Backed' Over Data

MIAMI - A new "hot line" device will piggy-back (human voice) communication simultaneously with 2400 bit per second data over a single unconditioned telephone line, a spokesman for Milgo Electronic Corp. said. The Model 20 voice adapter will allow users of Milgo's Modem 4400/24PB (data phone) to

monitor data being transmitted, and to discuss it or give instructions at the same time.

The Model 10 is designed for airlines, railroads, brokerage houses, or "whomever has communication between computers and satellite data processing operations," R.N. Nathanson told COMPUTERWORLD. It will allow a selection of voice/data, teletype/data, and full voice, he said. Up to eight teletype communications may be sent at once on the new device.

The telephone-sized adapter is plugged directly into a 2400-bps Modem, and it takes "full advantage" of narrow band transmission, Nathanson said. It will be introduced at the joint computer conference in Atlantic City, N.J., April 30 to May 2.



Milgo Model 10 Voice Adapter

New Show Tactics Used For Recruiting

NEW YORK - Employers at 71 career centers across the nation will sound out thousands of job candidates during 1968 - by machine. The number of candidates one recruiter can reach will be multiplied by a new electronic message repeater unit called the sound recruiter. Candidates and recruiters will be able to communicate without taking up each other's time, according to Careers Inc., developer of the new technique.

Machine of His Choice

About 1400 scientists and engineers are expected to register at the first mechanized career center, during a conference on the Institute of Electrical and Electronic Engineers, March 17-21 at City Squire Inn here. Sound recruiting machines will be utilized by more than 200 personnel executives of 40 firms.

A person who is interested in employment goes to the machine of his choice, picks up a telephone receiver, and hears a job description recorded by the technical supervisor who actually needs someone to fill the job. At the end of the three minute recording, the candidate hears

the name and phone number of the man to contact for an interview for that particular job.

Push a Button

A battery of electronic message repeater units, in the IEEE career center reception area, will contain tape recorded descriptions of new company programs and specific job openings. General literature about the firm will be stacked beside each machine.

A visitor to the center, whether he is a registered applicant or not, will be free to listen to whichever messages he chooses. All he need do is push a button to start the tape.

Similar units will be placed on Careers' red doubledecker London bus that will transport IEEE conferees between technical sessions at the Hilton Hotel, the career center at City Squire Inn, and an exhibit at the Coliseum. Careers plans to put additional units in hotels having large IEEE registrations.

Most of the taped messages will be made by companies actively participating in the career center, but some will come from firms not present.

Share XXX Argues Pros & Cons Of Guide Merger

(continued from page 1)

is for change," but Guide is related to knowledge of management needs and information. He argued that the merger would put "Hippo" in the center of the field and allow IBM to retire.

Share Losing Credentials

Roy Dickson argued for the merger. He said that since the advent of the 360, Share has been losing its credentials and is no longer unique. It is no longer effective in educating and influencing its two main goals.

Admitting that Share and Guide have different points of view, Dickson claimed that they do have the same problems and the same goals. A merger between the two would bring the points of view together to broaden the knowledge of each and help understand the other.

Without the merger, the organizations will continue to compete, said Dickson, and force IBM to make politically based decisions. With the merger, the framework for building a successful organization will be laid. He noted that there would be organization and communication problems, but that there was no meaningful alternative to the merger.

Ex-presidents OK Merger

A comment session followed the statements by Dickson and Roessler. Frank Wagner, North American Aviation, and an ex-president of Share, said that the consensus of the ex-president's committee was in favor of the merger. But he also noted that they were not convinced of disaster whichever way the vote went.

Wagner recommended that the

proposed joint meetings take place as planned as an experiment to help the membership make up its mind.

Joint Meetings

Ben R. Faden, North American-Rockwell, stated that both groups agreed that 360 software is not satisfactory, and improvement is the main aim of each. He asked if the fact that OS 360 was serving two masters was the reason that forced IBM to compromise.

Two "joint meetings" have been planned: a project meeting in Portland, Ore. in August and a General joint meeting in Atlantic City in October. In both cases the executive boards of Share and Guide are having meetings in the same city at the same time, but it is not yet clear how "joint" the meetings will be.

C S C Makes Change In Management

LOS ANGELES - Computer Sciences Corp. (CSC) has announced five major changes in management of its computer sciences division. Calvin D. Thimsen has been named vice president of a newly formed western region with headquarters at El Segundo, Calif. He was formerly director of northwest operations based at Richmond, Wash. Since joining CSC in early 1967, Thimsen has directed expansion of company operations in the Pacific northwest and Canada.

Richard F. Mayhew has been named vice president of a new southern region based at Huntsville, Ala. He joined CSC in 1966 as associate manager of the company's operations at Huntsville, where CSC supports the



R. F. Mayhew



C. D. Thimsen



H. L. Leone



L. B. Heine

NASA Marshall Space Flight Center.

In the new organizational structure, operations centers in the U.S. and overseas will report to regional vice presidents rather than to the president of the division.

Thimsen has been replaced as northwest operations director by the

former director of Houston operations, Harold L. Leone. Leone has been with CSC since 1962, when he established the company's first Texas facility at Houston.

Succeeding Leone at Houston is James A. Campise, who joined CSC in 1964. He was appointed associate director of Houston operations in 1967. A native Texan, Campise will now be responsible for expansion of CSC activities in Texas.

At the same time, LeRoy B. Heine has been appointed national manager for state and local government accounts. For 18 months prior to joining CSC, he was a self employed public relations and management consultant to the company. In his new job he will be based at Silver Springs, Md., a suburb of the nation's capital.

Plug-For-Plug Entry

Ampex Gives Details On Capstan Tape System

REDWOOD CITY, CALIF. - Details on the Ampex model TM-16 single capstan tape transport system have been released. The TM-16 reportedly holds tape in constant contact with the capstan, allowing full start/stop time to be used for uniform tape acceleration and deceleration.

The TM-16200 tape memory system reads, writes, and checks digital data in IBM computer formats with densities to 800 characters per inch, according to Ampex Corp. The memory system is designed for use as on-line or auxiliary tape memory for input and output, or for other digital

applications requiring high transfer rates. The TM-16 and TM-16200 permit reliable performance over an operating range of 75 to 150 inches per second, Ampex claims.

15 Seconds

The TM-16 system is said to be easily interchanged with the IBM 729 and 2400 series tape memories. The TM-16's straight line tape path allows loading "in 15 seconds or less." Its tape guiding reduces interchannel time displacement to no more than two seconds, Ampex says.

These details are included in a brochure just put out by Ampex.



Careers

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COMPUTER AIDED DESIGN Systems Analyst to support C.A.D. group. Degree and experience in scientific computing. Conn. location. \$14 - \$16K

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MANAGER OF SYSTEMS DEVELOPMENT Two years' managerial experience and systems and programming background. R.I. manufacturing firm. \$13 - \$16K

These are just four of the many job openings listed in DPC offices. For details contact the data processing professionals at:

data personnel consultants

Paul G. Roland 100 Constitution Plaza Hartford, Connecticut (203) 522-8248 Joseph R. Falvey 274 Weybosset Street Providence, Rhode Island (401) 274-7250 Dan L. Reen 60 Hickory Drive Waltham, Mass. (617) 893-0830 John F. Klar 1815 Ft. Myer Drive Arlington, Virginia (703) 525-6350

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Forecasting The Winner

Informatics Has CBS Election Contract

ENGLEWOOD CLIFFS, N.J. — The CBS News 1968 election estimating system is an on-line, real time system using duplex IBM System/360 Model 65s with extensive graphic displays. Programming will include: 1) data bank programs that provide facilities needed to create and maintain requisite data records, and 2) election night programs that will supply analytical reports and displays for televising.

It is still expected that all major news media will pool their news gathering facilities in NES (National Election Service). The IBM estimating system is simply an internal operation for purposes of election analysis.

Informatics Inc., a California based software firm, is now under contract

to Columbia Broadcasting System for development of in house computer programming to be used in the election night broadcast on November 5, 1968. The work will be carried out at Informatics' Englewood Cliffs facility, under the direction of Albert E. Burgess, project manager.

In addition to analytic models for the estimating system, CBS will provide news and production facilities. Informatics will supply programming for the election night system. The company specializes in design, programming, and support services in the implementation of computer based systems. Executive headquarters are at Sherman Oaks, Calif.

Univac Grows At Salt Lake City

SALT LAKE CITY — Univac will construct a 20,000 square foot addition to its Salt Lake City main plant. The new facility will house a complete printed circuit board manufacturing operation related to Univac Salt Lake City's recent assignment as a major engineering and production center for computer systems. Circuit boards for the Univac federal systems and data processing divisions will be manufactured at the new plant.

WILMINGTON, DEL. — International Telecontrol Corp. has formed a mathematical services division. The division will provide problem analysis, methods development, and computer programming support in the

Expansions

following areas: mathematical modeling and systems simulation of physical systems, scientific and engineering data analysis, and instrumentation systems planning and analysis.

WALTHAM, MASS. — BLH Electronics, Inc., a subsidiary of Baldwin-Lima-Hamilton Corp., will open a district sales office at 60 East 42nd St., New York. The new office will provide engineering sales and service to customers in New York City, Long Island, Westchester and Rockland counties, and northern New Jersey. John Joyce will manage the office.

Want To Take Your Teletype Around With You?

The Model 33 Teletype can now be made portable with a specially designed carrying case. Two carrying cases are available from Anderson Jacobson, Inc. The Model 33 KSR Teletype in its case weighs about 65 lb., the ASR weighs about 75 lb. Sets of four wheels are also available. The cases are available as accessory equipment for Model 33 owners, or as a system with the Teletype and connection cable to the company's portable acoustic data couplers installed. With the acoustic data coupler they provide a portable remote terminal for computer time sharing use. Anderson Jacobson, Inc., 2235 Mora Drive, Mountain View, Calif. 94040.

Moore Business Forms, Inc., has made changes in its Heavy-Duty Detacher to allow trouble free, continuous detaching production of continuous forms and tabulating cards. The Model 346A detaches from one part up to eight parts in a fastened set as a unit, or detaches one or more parts in the set, refolding the balance into packs for subsequent handling. Product Information Dept., Moore Business Forms, Inc., 401 Buffalo Ave., Niagara Falls, N.Y. 14302.

Two new optional devices for use with the CC-30 Communications Station have been introduced by Computer Communications, Inc. The CC-306 card reader provides the station with added capability as a remote computer terminal. It can read either binary or coded cards with selection of the mode under either computer or operator control. The portable unit reads 100 80-column punched cards per minute and loads the data directly into the buffer memory of the CC-301 display controller.



New Teletype carrying case.

The new CC-310 Videoprinter is a CRT display printer for use with the CC-30 Communications Station. Priced at under \$4000, the printer will provide either single or multiple hard copy output. Both alphanumeric and graphic images can be accommodated. Hard copies of the display can be obtained in less than 10 seconds. The printer process is dry, using no solutions or developing agents.

Both units will be displayed at the Spring Joint Computer Conference. Computer Communications, Inc., 701 W. Manchester Blvd., Inglewood, Calif. 90301.

New Products

A new computer based system for analysis of data from multiple gas chromatographs has been introduced by Digital Equipment Corp. Priced at \$45,000 plus \$1000 per channel implemented, the system includes the PDP-8/1 computer, a chromatograph interface, conversational software, and Teletype. GasChrom-8 is designed to save time, reduce human error, and increase the efficient scheduling of laboratory instrumentation. Digital Equipment Corp., 146 Main St., Maynard, Mass. 01754.

The IBM Program Information Department started using a new self sealing, corrugated container that is called Corro-Seal — for mailing punched cards and magnetic tape reels — less than a year ago. It has improved packaging efficiency, according to St. Regis Paper Co., which manufactures this product. In former days, the only sure way to deliver cards intact was in a combination of envelopes and cardboard boxes.

The new container material molds to objects of all shapes, and it forms a package that keeps dust out, St. Regis claims. Light pressure applied by machine or by hand is said to be enough to seal Corro-Seal packages. A cohesive coating sticks only to itself.

IBM's program information dept. at Hawthorne, N.Y., reportedly has reduced its use of envelopes, boxes, staples, and twine.

St. Regis, Sherman Division, 156 Oak St., Newton, Mass.

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As a member of this new, specialized systems organization within General Electric, you'll be able to enjoy the inherent benefits of a small company atmosphere along with the background strength of a large organization.

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Calcomp Opens Clothing Trade Service

ANAHEIM - Computerized pattern grading will be provided here for the apparel industry by a new division of California Computer Products, Inc. A Calcomp grading system will enable a computer to generate all sizes in a line of apparel, on the basis of designer's original model size. Computer calculations are drawn as graded patterns or sized patterns on a plotting system.

This new system grew out of a

two year pilot project, according to Lester L. Kilpatrick, president of the corporation. Computer generated patterns were supplied to leading apparel manufacturers in the pilot project on an experimental basis, he said.

The new division will explore more computer applications for the apparel industry. Automatic markers (the combination of patterns arranged for cutting cloth) and automatic cutting will be explored, Kilpatrick said.

Market Research Analyst

Rapidly growing EDP market research organization in convenient Boston suburb has immediate opening for analyst with two to four years experience. The person for this job must know the computer industry and its products. He must be a self-starter and want to work on a continuing variety of assignments.

Pleasant working conditions . . . salary \$8,000 to \$12,000 depending on experience . . . profit sharing plan . . . good possibility for rapid advancement into the company's young and growing management team. Send resume in complete confidence.

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SENIOR PROGRAMMERS

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Our representative will be interviewing in NEW YORK CITY DURING the week of MARCH 10, 1968.

To prearrange a convenient interview appointment, please call Mr. John S. Hargedon, collect, at (617) 268-3200.

If above time is inconvenient, please send resume, in confidence to Mr. John S. Hargedon, Personnel Department.

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United Utilities Aide Named



Dr. Andre Levy

Dr. Andre Levy has been appointed manager of marketing for the computer division of *Electro-Mechanical Research, Inc.*, Minneapolis.

Richard E. Doughton has been appointed manager of education and training for *General Electric's* information systems sales programs operation in Phoenix.

Jack Neal has been named corporate director of marketing for *URS Corp.* Responsible for all marketing activities of URS, he will maintain his office in Washington, D.C.

Fred C. Lewis has been promoted to the position of vice president and general manager of *Control Data's* products and components group.

Joseph P. Sabol has joined *Decade Computer Corp.* as market development manager.

Bernard Tannenbaum has been named technical director of the New York division of *International Programming Corp.*

Dean Phillip Seibold has been named senior staff assistant - systems, for *United Utilities, Inc.*, which operates the United Telephone System. As such, he will be on the headquarters staff in Kansas City, but he will be working with all six computer centers serving the United System. Seibold had been a systems engineer for IBM before he joined United.

Robert J. Ebba has been appointed manager of the data sciences department in *Bunker-Ramo's* defense systems division. Ebba, who joined Bunker-Ramo in 1965, is a former member of the division's marketing operation.



G. H. Thomas

Geoffrey H. Thomas has been named national director of commercial marketing for the computer sciences division of *Computer Sciences Corp.* The newly created position marks a "significant intensification of the company's mar-

keting program for its business-oriented services," according to division president William R. Hoover. Thomas will plan and direct the marketing of CSC's capabilities in information sciences relating to the commercial applications of computers.

Thomas F. Cull has been appointed director of advanced computer systems at *Honeywell EDP.*

David C. States has been appointed director of the *Control Data Institute*, Minneapolis.

Walter M. Johnson III has been named president of *Computer Usage Education, Inc.*, a wholly owned operating subsidiary of Computer Usage Co., Inc.

Dean Gardner has been elected vice president of *Statistical Tabulating Corp.*, Chicago. A member of the board of directors, Gardner will act as corporate officer in charge of research and development.

Thomas B. O'Heir has been appointed product manager, special products division, *Honeywell EDP.*

Hybrid, Digital Jobs Mix On 6600

The Missile Systems Division of *Raytheon Company* has ordered a *Control Data* 6600 computer system to be integrated with a large-scale analog computer. When operational late this year, the system will be capable of running multiple hybrid missile simulations, as well as digital scientific computations, on a concurrent basis. In a typical operation, the system will devote a fraction of each millisecond of processing time to hybrid jobs, and the remainder to digital jobs, without intervention by any monitor or executive program. A combination of hardware and software techniques will make this possible.

Adage, Inc., Boston, has delivered an Ambilog 200 general purpose hybrid computer to *TRW Systems Group*, Inglewood, Calif. The computer will be used for acquiring and reducing data in real time and for on-line signal analysis.

Bryant Computer Products has received a \$3 million order from *AEG-Telefunken* for 20 Bryant series 4000 disk file systems. *AEG-Telefunken*, Frankfurt, Germany, is considered one of the leading manufacturers of large scale data processing systems in Europe.

The *Air Force Systems Command's* electronic systems division has awarded a \$15.6 million contract to *North Electric Co.*, Galion, Ohio. The contract calls for North Electric to design and build tactical electronic switching centers for the Air Force's 407L tactical air control system.

Planning Research Corp. has received a contract from the *Department of Labor, Manpower Administration*, to develop an employment plan of an eastern low income urban area. The plan will follow the requirements and recommendations of the Model Cities Administration and will provide an actual example of a program for employment, training, and allied areas. Although based on existing conditions in a single city, the analysis will be able to be modified for use by other cities. Dr. Norman H. Jones will manage the project team.

Orders and Installations

The software and computing center of *TRW Systems Group* has installed an *SDS 940* time sharing computer. The computer was added to augment the on-line computing facilities available to TRW technical personnel.

Computer Applications Inc., San Diego, has announced an agreement with IBM to convert the PDQ-7

nuclear reactor program for use on a System/360 computer. The work will be done by Computer Applications personnel in New York.

Grumman Aircraft Engineering Corp., Bethpage, N.Y., has installed a *Control Data* 3300 System for processing test and checkout data on the NASA/Grumman lunar module to be used in the Apollo Space Program. The computer is linked to a previously installed *Control Data* 3200 system through two CDC 854 disk storage drives and a 3682 satellite coupler, and processes data through the Lunar Module reduction station in two steps. A new software system comprised of *Control Data's* Mso and Scope is being used at Grumman.

Senior Programmers

Experience in data processing with business programming using IBM 1400, 7000, or 360 series tape/disk computers. COBOL required. Position involves planning and preparing block diagram programs and all related work including instruction of computer operating personnel and general systems documentation.

Management Systems Analysis

Experience in the development and implementation of management information systems; knowledge of EDP and government requirements such as Mil Q 9858A is required. Duties include procedures writing, special management studies and installation of plant-wide systems.

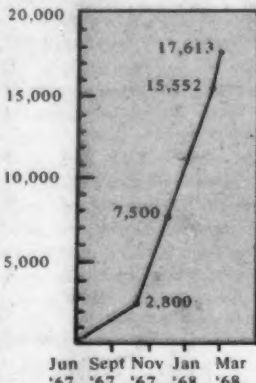
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COMPUTERWORLD Population Report

In only nine months (June 1, 1967 - March 1, 1968) COMPUTERWORLD has gone from Zero to 17,613 paid subscriptions:



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A Popular Request Reprint Salaries Vary Across U.S.

Average salaries for the same job vary by up to one-fourth, depending on the section of the country. This is one of the results of a national salary survey conducted last year by International Data Corp.

The survey was first published in COMPUTERWORLD last year. Because of many requests from new readers, we are reprinting it this week and next.

The survey shows the average weekly salary of each position in each of nine sections of the country. These are presented in Table I.

For proper evaluation, however, one needs to know the number of people employed in each area. This is itemized in Table II.

Pay is high in the Middle Atlantic and Pacific states, but is best (and the fewest people are employed) in the Mountain states.

Many people will be surprised that pay is highest in the Mountain states. The large computer installations in the aerospace firms in California are well known for offering some of the highest salary levels in the country. However, these high peak salaries are counterbalanced by lower salaries at many smaller installations in the Pacific states. The Mountain states have far fewer computer installations than other parts of the country, but most of those that do exist are medium to large scale installations, so the salary levels are comparatively high.

No matter what the average weekly salary, there is obviously great variation within each geographical area. The average programmer would probably do better in the areas where there are a larger number of openings, such as the Middle Atlantic states or the East North Central states, because there are more people for him to exceed.

Six positions are reported this week. Their job definitions are:

Geographic Area	Manager Computer Programming	Senior Computer Programmer	Computer Programmer	Coder	Manager of Systems Analysis	Senior Systems Analyst
New England	\$212	\$168	\$127	\$100	\$250	\$195
Middle Atlantic	230	179	143	108	255	197
South Atlantic	197	160	125	99	244	194
E. North Central	206	168	129	104	243	181
W. North Central	206	160	125	98	238	184
E. South Central	186	142	119	95	242	199
W. South Central	207	175	133	101	240	186
Mountain States	230	187	137	106	263	215
Pacific States	229	181	138	116	247	192
National Average	\$214	\$171	\$132	\$102	\$247	\$191

Geographic Area	Manager Computer Programming	Senior Computer Programmer	Computer Programmer	Coder	Manager of Systems Analysis	Senior Systems Analyst
New England	1300	2200	3906	4000	1200	6300
Middle Atlantic	3100	5800	9300	9300	2900	15,500
South Atlantic	1850	3300	5550	6000	1700	7700
E. North Central	3400	6000	10,200	10,300	3200	15,000
W. North Central	1200	2100	3600	3800	1020	4400
E. South Central	600	1100	1800	1900	520	1900
W. South Central	1200	2200	3600	3700	1050	4400
Mountain States	580	950	1740	1900	505	1800
Pacific States	2200	4800	6600	6800	2000	10,500
National Total	15,430	28,450	46,290	47,700	14,095	67,500

MANAGER OF COMPUTER PROGRAMMING

Plans, organizes, and administers the preparation of computer programs.

Direct responsibility: All phases of programming; review and evaluate the work of the programming staff; establish standards.

Deals with: Installation personnel involved in the detailed steps of implementing a computer application on existing or proposed equipment.

Responsible to: Manager of Data Processing.

SENIOR COMPUTER PROGRAMMER

Prepares flow charts outlining the solution of problems on the computer, and guides and/or executes preparation of the actual instructional steps of the program.

Direct responsibility: Analysis of problems outlined by systems analysts; preparation of project flow charts; verification and correction of logic in programs; instructional notes for operators for production runs, or coded machine instructions.

Deals with: Technical personnel in systems analysis and computer application planning.

Responsible to: Manager of Computer Programming.

COMPUTER PROGRAMMER

Prepares instructions in a computer program.

Direct responsibility: Preparation of computer applications logic flow charts and block diagrams (or assistance in their preparation); assistance in the preparation of test data and trial runs, and the development and documentation for all systems procedures; coding of the instructions for computer programming.

Deals with: Other installation technical personnel.

THE STATES COMPRISING EACH OF THE NINE GEOGRAPHIC REGIONS IN THE IDC DATA PROCESSING POSITION SURVEY ARE:

NEW ENGLAND: Connecticut Massachusetts Maine New Hampshire Rhode Island Vermont	MIDDLE ATLANTIC: New Jersey New York Pennsylvania	SOUTH ATLANTIC: Delaware District of Columbia Florida Georgia Maryland North Carolina South Carolina Virginia West Virginia
EAST NORTH CENTRAL: Illinois Indiana Michigan Ohio Wisconsin	WEST SOUTH CENTRAL: Arkansas Louisiana Oklahoma Texas	PACIFIC: Alaska California Hawaii Oregon Washington
WEST NORTH CENTRAL: Iowa Kansas Minnesota Missouri Nebraska North Dakota South Dakota	MOUNTAIN: Arizona Colorado Idaho Montana Nevada New Mexico Utah Wyoming	EAST SOUTH CENTRAL: Alabama Kentucky Mississippi Tennessee

Responsible to: Senior Programmer and/or Manager of Computer Programming.

CODER

Prepares detailed machine instructions in a computer program.

Direct responsibility: Conversion of block and logic flow diagrams to detailed computer instruction codes.

Deals with: Members of Computer Programming department technical staff.

Responsible to: High level computer programming.

MANAGER OF SYSTEMS ANALYSIS

Plans, organizes, and administers creation and implementation of new or revised systems and procedures connected with the use of the computer and the operation of the installation.

Direct responsibility: Assigns systems and analysis staff to projects, directs their activities; feasibility studies and systems design.

Deals with: Staff members and other departments concerned with systems and procedures.

Responsible to: Manager of Data Processing.

SENIOR SYSTEMS ANALYST

Analyzes problems presented to the computer installation, their requirements, and prepares procedures for their solution.

Direct responsibility: Creation of workable systems for problem solution; careful documentation of existing and revised systems and procedures; revision of logic and procedures in any existing systems not functioning properly; preparation of block

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EVALUATION AND SELECTION OF COMPUTER SYSTEMS. An in depth five day program for managers and senior systems analysts. Offered in Washington during May, New York in June, Boston in June, Los Angeles in September, and Houston in September.

TIME SHARING SYSTEMS. Become familiar with the effects and implications of a time sharing system on systems programmers, users, and management, and all the other facets of time sharing. This five day program will be conducted in Washington during May, New York in June, Chicago in September, and Los Angeles in September.

Career Development Programs

COMPUTER INDUSTRY MARKETING. If you are interested in a career in computer marketing, this could be your big opportunity. This is designed for making good marketing men from programmers, systems men, and other professional salesmen that meet our high standards to qualify for this program. Initial program begins during May in Washington. Future programs in Boston, New York, Los Angeles and Chicago. P.S. If you are an employer interested in knowing more about this or possibly interested in our graduates, do contact us.

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FINANCIAL MATTERS

COMPUTER SYSTEMS

MINNEAPOLIS - *Control Data Corp.* plans to raise \$15 million through an offering of 20 year guaranteed convertible debentures. The debentures, due 1988, will be issued through Control Data's subsidiary, CDC International Finance Corp. The securities will be publicly offered in Europe through underwriters and will be convertible into Control Data common stock after six months.

CDC International was organized to raise funds abroad for use in financing CDC's expanding foreign operations in a manner which will comply with the U.S. Foreign Direct Investment Program and contribute to the United States' balance of payments.

SOFTWARE & EDP SERVICES

NEW YORK - *Computer Applications Inc.* reported revenues of \$9,485,221 for the first quarter ended December 31, 1967. The figure compares with \$8,267,343 for the similar period the prior year. First quarter net income was \$140,744, or \$.08 per share, compared to \$228,823, or \$.12 per share a year ago, adjusted to reflect a pooling of interests for an acquisition which occurred in January, 1968. Average shares outstanding at December 31 were 1,210,603, compared to 1,086,880 a year ago.

PRINCETON, N.J. - *Applied Data Research, Inc.* reported operating revenues of \$2,870,380 and net earnings of \$234,245, or \$.43 a share, based on 550,838 shares outstanding for the year ended December 31, 1967. This compares with operating revenues of \$2,386,656 and net earnings of \$62,814, or \$.12 a share, in 1966. Operating revenues and net earnings were the highest for any year since the company was founded in 1959.

SAN MATEO, CALIF. - *URS Corp.* reported earnings of \$181,614 for the fiscal year ended October 27, 1967, compared with \$64,704 for the previous year. Sales rose 65% to \$5,346,653, as compared to \$3,237,334 in 1966. Earnings per share in 1967 were \$.85 based on 214,673 in 1966. Company president Richard De Lancie attributed the substantial gains to strong growth in the company's computer-related work.

NEW YORK - *Programming and Systems, Inc.* stockholders voted to approve a 4 for 1 stock split and to amend the certificate of incorporation, changing the authorized capital stock from 4,000,000 shares of the par value of 2-1/2 cents per share to 5,000,000 shares of the par value of 8 cents per share. Three additional shares of new stock will be issued on March 29 for each share of present stock to holders of record March 9. Shares outstanding will be increased from 589,888 to 2,359,552.

New Literature

Photocomposition Data

The Why and How of System G: A Guide to Photon's New, Widely Compatible System for Automated Production of Engineering Schematics. 20 pp. Free. Order from: Engineering Graphics Division, Photon, Inc., Wilmington, Mass. 01887.

Describes Photon's new method of typesetting and graphics composition. System's input technique makes it possible for limited skill operators to produce camera ready photocomposition of ruled forms, scientific work, music, charts, and display advertising.

Computer Talk Quarterly. Free. Order from: 3M Co., 3M Center, St. Paul, Minn. 55101.

New technical service bulletin for the computer industry. Initial issue deals with handling and storage of computer tape. Format is suitable for 3 ring binder insertion.

How to Increase Computer Throughput with Cope .45. Free. Order from: Data Communication Systems Division, Computer Industries, 10655 Harry Hines Blvd., Dallas, Texas 75220.

Brochure describes Cope .45 remote data communications terminal. Lists specifications for each system component.

SDS Hybrid Simulation Systems Capabilities. (66-07-09A) 12 pp. Free. Order from: Advertising Dept., Scientific Data Systems, 1649 17th St., Santa Monica, Calif. 90404.

Salary Survey

(continued from page 6)

diagrams outlining the nature of processing in proposed applications.

Deals with: Personnel involved in the definition and analysis of existing and proposed computer applications.

Responsible to: Manager of Systems Analysis.

Brochure describes SDS hybrid simulation systems. Systems combine the accuracy of a digital computer with the response of an analog computer, are useful in simulating physical phenomena or processes. Systems are built around Sigma computers. Brochure also describes SDS software.

ACM Presidential Election Story

(continued from page 1)
The job in Washington does not necessarily mean that the headquarters have to move there."

Demands For Services

He sees that the membership is demanding more services and hopes to be able to give them more. "A particular need is in the areas of the special interest groups," he said. "The groups on real time processing, time sharing, personnel and business data processing I know need and deserve a better information system - and I expect that the other groups do too. If I were to be elected I would try to do something about it."

He sees the role of the ACM and its groups very much the same as Galler sees it - the role of special advisor rather than lobbyist. "In the business data processing group, for instance, we work with the computer problems...studying the problems of large data bases rather than application oriented studies. There are other organizations who take care of specific applications, and it is as well to keep the two apart."

Both Appear In Atlantic City

Both Galler and Canning will be publishing formal statements in the next month, and both will appear at a special forum during the Spring Joint.

Computer Stocks: Trading Summary

Week Ending March 8, 1968

NEW YORK STOCK EXCHANGE	1967		Week		Last	Week Net Change	Week % Change
	High	Low	High	Low			
Addressograph-Multigraph	80 1/2	46 7/8	59 5/8	54 5/8	57 1/2	- 7/8	- 1.52
American Research	195	37 3/4	136 3/4	122 1/2	133 1/2	- 2 1/2	- 1.87
Amper Corp.	40 3/4	22 3/4	29	26 1/2	27 1/8	- 1 7/8	- 6.91
Burroughs	198 5/8	80 7/8	175 3/8	157	168 1/2	+ 5 1/8	+ 3.04
Collins Radio	114 7/8	53	707/8	65 1/4	68	+ 1/4	+ 0.37
Control Data	165 5/8	33 1/2	110	95 1/8	107 1/4	+ 5 3/4	+ 5.36
Electronic Associates	30 1/4	16 3/4	21 1/2	18 1/4	20 1/8	+ 1	+ 4.97
General Electric	115 7/8	82 1/2	87 7/8	84 3/4	86 5/8	- 5/8	- 0.72
Honeywell	117 7/8	63 1/2	93 3/4	89 3/8	93 1/8	-	-
IBM	648	362 1/2	590	560	579 1/2	+ 2 1/2	+ 0.43
Litton	120 3/8	62 1/2	67 7/8	62 1/2	66 1/8	+ 2 3/8	+ 3.59
Sat Cash Register	136 5/8	67 1/8	103 7/8	99 1/2	101 3/4	- 2 1/8	- 2.09
RCA	65 1/2	42 5/8	47	45	46 1/2	- 3/8	- 0.81
Raytheon	117	49	81	73 1/8	79	+ 3/4	+ 0.95
Sanders	77 1/4	37 5/8	47 1/8	42 1/4	44 1/2	- 1 5/8	- 3.65
Scientific Data	152 3/4	70 3/8	122 3/4	108 3/4	119 1/2	+ 1 3/8	- 1.15
SCI	82 1/4	39 1/2	43	39 1/2	41	-	- 2.44
Sperry Rand	65 1/8	28 1/8	46 3/4	41 7/8	45 3/8	+ 3/8	+ 0.38
NYSE COMPUTER STOCK AVERAGE						- 4.72	- 0.20

AMERICAN STOCK EXCHANGE	1967		Week		Last	Week Net Change	Week % Change
	High	Low	High	Low			
Automatic Data Processing	68 1/2	41 1/2	46 7/8	42	45 1/2	- 1 1/2	- 3.30
Bunker Ramo	21 7/8	7 1/2	13 7/8	11 3/4	13 5/8	+ 1/8	+ 0.92
Calcomp	46 3/4	26 3/4	32 3/4	26 3/8	29 7/8	- 2 1/4	- 7.53
Computer Applications	47 3/8	14	23 7/8	20 5/8	23 1/2	+ 5/8	+ 2.66
Computer Sciences	67 5/8	18	37 5/8	31 5/8	35 1/2	- 4 3/8	-12.32
Digital Equipment Corp.	154	29 3/8	109 1/4	95 1/4	101 3/4	- 1/4	- 0.25
GC Computer Corp.	41	23 1/4	30 1/4	27 1/2	29 1/8	+ 3/8	+ 1.29
Leasco	146 1/4	33 5/8	101	90 1/4	93 1/8	- 4 7/8	- 5.23
Lewin-Townsend Computer Corp.	77	10 7/8	48	41 1/2	46 3/8	+ 1/2	+ 1.08
Milgo Electronics	23 1/8	5 1/8	17	15 1/2	16 1/8	- 3/4	- 4.65
Mohawk Data Sciences	198 1/2	108	129 1/4	108	124	+ 8 7/8	+ 7.16
Planning Research	51	27 5/8	32 1/4	30 1/2	31 1/4	+ 1/4	+ 0.80
Potter Instrument	40 1/2	12 3/8	26 5/8	22 1/2	26 5/8	- 1	- 6.06
Randolph Computer Corp.	55 3/4	32 1/4	39 3/8	34 5/8	37 5/8	- 3/8	- 1.00
AMEX COMPUTER STOCK AVERAGE						- 0.33	- 1.74

OVER-THE-COUNTER	1967		Friday		Last Friday	Week Net Change	Week % Change
	High	Low	Bid	Asked			
Applied Data Research	17	15 1/2	17	19	17	-	-
Aries Corporation	30 1/2	12 3/4	17	18 1/2	15 1/2	+ 1 1/2	+ 9.68
Bolt, Beranek & Newman, Inc.	30	8 1/4	16 3/4	17 3/4	17 1/4	- 1/2	- 2.90
Computer Usage	72	20 1/4	39 1/2	41	39	+ 1/2	+ 1.28
Cyber-Tronics	19	4 3/4	12	12 3/4	12 1/4	- 1/4	- 2.04
Data Products	23 3/8	2 1/2	14 3/8	14 3/4	15 1/4	- 7/8	- 5.74
Digitec	27 1/2	6	19	19 3/4	19 1/4	- 1/4	- 1.30
DPA, Inc.	17 3/8	4 1/4	12 3/4	13 1/4	13 1/4	- 1/2	- 3.77
Electronic Memories	57 1/2	12 3/4	36	37	39	- 3	- 7.69
Fabritek	15 3/4	6	9 5/8	10 1/8	10	- 3/8	- 3.75
Informatics	59 1/2	7 1/2	34	36	35	- 1	- 2.86
LNC Data, Inc.	16	7 3/8	10	10 1/2	10 1/2	- 1/2	- 4.76
Management Assistance	24 3/8	10 1/8	11 1/4	11 5/8	10 7/8	+ 3/8	+ 3.45
Memorex	67 1/4	52	54	57 1/2	58	- 2	- 3.48
Optical Scanning	102	25 3/4	77	80	74	+ 3	+ 4.05
Recognition Equipment Corp.	45 1/2	38 1/2	41	42	40 1/4	+ 3/4	+ 1.86
Systems Engineering Labs	63 1/4	8 7/8	44 1/2	46 1/2	45	- 1/2	- 1.11
University Computing Co.	95	57	57	59	63	- 6	- 9.52

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How To Answer Box Number Ads:

All replies to CW box numbers that appear without an address should be sent to Computerworld, 129 Mt. Auburn St., Cambridge, Mass. 02138.

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Mag Tape Aimed At Paper Tape

PLAINVIEW, N.Y. — A write only, magnetic incremental tape recorder — for recording data in industry compatible format for immediate data processing — was introduced here by Potter Instrument Co. Applications of the new ME-4210 are data logging, data transmission, and office machine output.

Potter claims that its new device offers IBM compatible magnetic tape recording in the same price range as paper tape equipment. Recording accuracy is said to be better than 10,000,000:1.

New facit incremental write only magnetic tape recorder for direct data transmission.

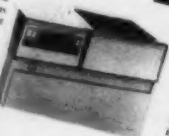


WHAT'S GOING ON HERE?

TERWORLD
for the Computer Community

Fast Disk Drives Marketed By MAI

NEW YORK — Disk based 360 users may soon be able to improve their results of a marketing agreement between Memorex and MAI.



Memorex's Peripheral Systems Division which makes the 610. Memorex 610 is only 50 mm. 33% faster than the 75 mm. average time of the IBM 2311 Model 1 which it can replace.

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*To investigate this news story COMPUTERWORLD checked on the facts behind it. Our representatives visited MAI's offices in New York City — inspected the all-important timing curves at the engineering plants in California — for both the new system and for the standard IBM 2311s.

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Details Of The Packages

User Applications For NCR Centuries

One of the major points about any new computer system today is the richness of the application packages that are available from the manufacturer at no additional cost. These packages have to be approached with caution, because they may have a number of implications that are not apparent on the surface, and patching them to fit a particular installation may not be possible. These are items that each installation will have to check for itself.

Even allowing for this caveat, however, it is clear that the application packages for the NCR Century series are extensive and useful — not only in the field of retailing where the company is traditionally strong, but also in general business and educational areas. Below we give details on some of the packages for your perusal.

In a future issue we will comment on the quite unusual programming methods used on the NCR Century series — Are they a break through, or are they paper creators?

I - RETAILING AND FINANCIAL APPLICATIONS.

A) APPLIED PROGRAMS FOR RETAILERS. All the requirements of a department store can be met by software programs that have been written for conversion to the new NCR Century computer, according to A.H. Ecton of NCR retail systems. Reports for register balance, salesperson activity, and daily and weekly reports, are provided by the NCR applied sales audit program. Magnetic files for input to other applied programs, such as accounts receivable, are also generated by this program.

Customer statements, history information, automatic dunning if desired, collection follow up data and control reports for each billing cycle — are provided by the applied program for accounts receivable. This system is claimed to be a complete credit management system.

Vendor checks can be written by the Century Computer under the applied program for accounts payable. Vendor analysis reports, debit memos, journals, merchandise and expense distribution information can be prepared under the same program.

B) CENTRAL INFORMATION FILE FOR COMMERCIAL BANKS. Mixed item capture of all banking media in a single processing stream is provided by the central information file available to any commercial bank having assets of \$10,000,000 or more. High speed disk sorting then takes over to apply the data to a full range file that is maintained on magnetic disk files.

Any workable identification number may be used as a central cross reference under the program for single number account control. This could be a social security number or demand deposit account number. This key is linked with other customer account or activity data through use of central, random access tables. Any inquiry on any account or file automatically places the full information on that customer at the disposal of the bank officer initiating the request.

C) CENTRAL INFORMATION FILE FOR SAVINGS AND LOAN ASSOCIATIONS. Virtually all savings and loan associations are able to have automated central information file systems with the Century computer, according to NCR. This means that any inquiry for any account, whether it be made numerically or alphabetically, automatically is referred to a central table. The inquiring officer receives a complete data summary of all business transacted with the institution by any customer.

From a management standpoint, the same set of programs will keep the institution's general ledger continuously updated as a byproduct of routine processing. Thus, at any time, an executive may call for and receive within seconds an immediately current statement of condition.

D) COMPREHENSIVE LIFE INSURANCE PACKAGE.

A departure from the practice of superimposing electronic capability upon a conventional insurance accounting procedure, is seen in the life insurance management performance system. It determines "true" current profits from sales and operations, analyzes rates of return on equity values, and develops model office projections that reflect advantages and disadvantages of alternative courses of action. Expense budgets, production quotas, and distribution of sales can be established under the system. Also, actuarial calculations are processed, prospects' insurance requirements are analyzed, underwriting chores are

handled, policy holder notices are produced, and commissions are calculated by the new system.

II - INDUSTRIAL AND COMMERCIAL APPLICATIONS.

A) PRODUCTION CONTROL SYSTEM FOR SMALLER MANUFACTURERS. The small manufacturer can achieve maximum control over his inventory and production equipment utilization for "as little as \$2250 per month," NCR says. Companies in the \$1,000,000 to \$30,000,000 annual sales range are said to be particularly appropriate for the Century production control system for smaller manufacturers.

Plant raw material inventories are controlled by integrating engineering changes, material acquisitions and material releases from stock. Current and future production and purchasing requirements are printed out. Management is said to be kept abreast of shortages and the status of items on order, and all production orders can be coordinated. The system describes parts and assemblies, quantities to be taken from stock, stock locations, and delivery areas in the plant. The system, according to NCR, is most adaptable to manufacturers in the ordnance, furniture, machinery, transportation equipment, electrical and precision equipment fields — as well as fabricators of metal products.

B) COMPREHENSIVE HOSPITAL ADMINISTRATION PROGRAMS. The capacity for full automation of hospital data processing is provided for \$2250 per month, NCR says. Complete operating system capabilities are claimed for the smallest of the new Century series computers.

Complete record keeping for both personnel utilization and labor cost accounting and analysis are claimed. Payroll earnings and deductions are processed automatically, with the computer following through with cumulative deduction control and governmental tax reporting. Both cost and budget expense figures are regularly produced and a comparison is made of budgeted and actual positions.

Administrators are advised of requirements in personnel planning in advance of implementation dates, by a personnel services forecast report. Included are data on fringe benefit eligibility, vacation entitlement, advancement reviews and other personnel commitments.

A file oriented approach is followed in patient record keeping operations. Systems performed by the system include pricing of room and service charges, analysis of revenues, and processing of health insurance settlements. Up to four separate types of insurance coverage are routinely applied to each patient's account by the system.

C) POLICE AND OTHER PROGRAMS FOR LOCAL GOVERNMENTS. To assist law enforcement, information for the patrolman's initial investigation is provided by the Century computer's capabilities. Details of criminal history, stolen and wanted vehicles, guns and identifiable articles — can be obtained from the basic disk file. The dispatcher can advise a patrol officer who, for example, calls in the license number of an automobile he suspects may be stolen.

The Century series law enforcement package is said to be completely compatible with the Federal Bureau of Investigation network, which is expected to become standard. Thus, data prepared for entry into a local police department's Century file can be teletyped in the same format to the FBI.

Other applied programs include a utility billing and collection system, and a comprehensive payroll system. The Century 100 is said to be feasible for a single municipal department because of its low cost, while its speed and expandability are said to make it appropriate for communities that wish to automate several agencies.

D) COMPLETE SCHOOL ADMINISTRATION SUPPORT.

A philosophy of application readiness has been applied, NCR says, to all members of the Century series family. Equipment configurations range from the Century 100, which at \$2250 per month (not reflecting a 15% educational discount) is claimed to be the lowest cost computer ever marketed with complete operating system capabilities through more comprehensive configurations.

The secondary school administrative system is served by random access disk files. That is, data on class availability, teacher or pupil schedules, attendance, and other day to day information is entered into a data processing system randomly, as it occurs.

An optimum class schedule is developed and matched with student course selections by the computer. Complete class lists and student schedules are produced.

A complete academic transcript, test score results and data on academic major sequences, for each student, are contained in a student master file. School census data from student records is summarized and kept up to date each secondary school district can comply with report requirements of government agencies.